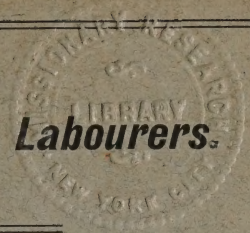


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The Diet of Native Labourers.

A LECTURE

READ BEFORE THE

RHODESIA SCIENTIFIC ASSOCIATION,

SALISBURY BRANCH,

BY

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THE DIET OF NATIVE LABOURERS.

Lord Milner, in his despatch to Mr. Chamberlain dated December 6 last, explaining the reasons for the late proclamations with regard to labour, liquor, and other matters, mentions his reasons for temporarily prohibiting the use of kafir beer in towns and public diggings. He says: "Personally, I am not at all convinced that, under proper control, the use of it might not be allowed without injury, and even with advantage, to the natives." And further on he says: "When, however, we find ourselves masters of the situation, we may be able to allow the use of kafir beer, in moderate quantities and under proper control, in the mine compounds; although in the exceedingly well-managed Kimberley compound the natives seem to be both well and happy without it. Its use by natives in their houses the law, even as it stands, does not attempt to prevent."

In connection with the serious question thus impartially put forward, what I now wish to do is to mention the results of some enquiry, observation, and thought on the wider subject of the whole diet required in order to keep native labourers in health and strength. It is a subject so large that I can only pretend to lift up a fringe of it, and promote thought, discussion, and experiment. It is a subject so great that it touches the responsibility of the governing race and the "white man's burden," but it is a subject so domestic and near to us individually, that it affects us all in our very pockets. It is our own bread and butter question; none of us are unconcerned in native labour. It will be found to be a farmer's question too.

The question of the utility of beer is one part, and an important part, of this subject. With regard to that the first question is: What is kafir beer? And that is a question that would puzzle many to answer. It is my purpose, in

the reflections which I am about to make on the subject of "diet for native labourers," to include particularly the consideration of the use of fermented food and drink by natives.

It is of the first importance that a distinction should be clearly apprehended between what the Basuto call "leting" and "joala," the fermented drinks they use. The former would be called "sweet wort" in England. It is generally used by the Basuto, and is not intoxicating. The latter is intoxicating, and is rightly called kafir beer.

"Joala" is generally made with the object of producing a drink of the greatest intoxicating strength attainable by native manufacture.

"Leting" is generally made with the object of producing an acidulous or acid, refreshing and nourishing drink of little or no intoxicating quality.

Between the two there are drinks of various grades of intoxicating strength manufactured. All these drinks eventually become very sour, and are drunk in that state, as well as fresh, till acidity or decomposition goes too far.

What the Basuto call "(bo) joala" the Kafirs and Zulus call "(ubn) tjwala."

Something like "leting" is, more or less, used by other tribes. The Matabele or, Amandebele, call it "ibila."

Missionaries in Basutoland freely use and recommend leting while strongly opposing the use of "joala." Europeans there often use "leting."

It appears evident that the primitive beer of olden time must have been thick, and much like those present Basuto beverages, and would not keep. The Ancients had not the knowledge, means, or vessels we now possess for making, clarifying, and keeping beer.

When wine was used among the ancient Greeks and Romans, they put

it in leathern bottles, and afterwards they used earthenware jars, and in these the wine would not keep long.

Xenophon, who lived some four centuries before the Christian era, described the Armenians as habitually drinking a fermented liquor made of barley with the malted grain in it. They sometimes stooped to drink it directly out of big pots, and sometimes they sucked it up from those pots through reeds.

Tacitus mentions beer as the usual beverage of the Germans, as it no doubt was of the nations to the north-east of the Germans. These nations still drink it. Russians to this day delight in the use of a thick, non-intoxicating, sour, fermented beverage called "quass." It is generally made from barley or rye meal, and must not be unlike "leting." Russians sometimes boil cabbage in "quass."

In the century preceding the Christian era, Julius Cæsar, during his campaigns, used to supply his soldiers with what is mentioned as "beer" and "vinegar." This he evidently did in order to keep them in health and prevent scurvy—the common scourge of armies in prolonged wars. When in Gaul, he must naturally have used the grain of that country, and the primitive methods of making beer and vinegar in use there.

In the following century, Pliny, the naturalist, wrote that all the nations of Western Europe made beer, and he mentions, as something peculiar, that the people of Spain were making a beer that would keep some time. Probably this was like what the North-Eastern Mashonas make, as I shall describe. It was, I believe, at a later period that Alexandria developed the first recorded manufacture of a keeping beer, and exported it.

In the long voyages of old times, sweet wort made from malt was very often effectively used as a drink for sailors to prevent or cure scurvy, which used to be very fatal among them before ships were, by law, required to have on board the handier drink—limejuice—as well as vegetables, etc., and particularly potatoes.

During a drought in 1851 or 1852 the

troops at Bloemfontein were suffering from scurvy owing to the scarcity of juicy meat, fruit, and vegetables. A military doctor prescribed for them the cheap and easily made Basuto "leting," or sweet wort, and with very beneficial results. Whether this officer intentionally followed Cæsar's lessons I do not know.

About 1862 again there was another great drought; many of the inhabitants of Bloemfontein were, from the same causes as in 1851 or 1852, attacked with scurvy, "leting" was then again prescribed with success.

Very probably its use might have prevented much of the disease which has existed during the present war among the military and in the refugee and concentration camps, which could not, owing to the devastation of the country, be well supplied with fruit and vegetables.

In about 1877 and 1878, on my arrival to survey at Griquatown. I was asked to inspect the prisoners in the goal there, as there was no medical man within 100 miles, and the prisoners were ill, and several had died. I found them suffering mainly from scurvy, with complications, and at once recommended that kafir corn should be malted and letting given to them daily, and pending the malting, that sugar beer should be quickly made and supplied. This was done, and, with fresh air and other regimen, was successful in restoring them to health.

About that time and not long after, there was serious mortality in the goal at Kimberley, especially among prisoners of war, and I have little doubt it was to a large extent from the same cause.

I suspect that some of the mortality we have sometimes heard of among labourers at mines, where they live under conditions as to diet which are abnormal, may be caused by some deficiency, not in the quantity but in the character and preparation of their food; some want which letting and other articles of diet might supply; something vegetable or sub-acid or which had undergone some measure of fermentation.

Labourers on farms in some parts of Scotland are habitually given "sowens" as part of their diet; this is an acidulous drink, and is made

from the fermented husks or bran of oats. "Flummery," in England, is something of the same sort, but is somewhat different.

"Leting," as made by the Basuto, would be liked by native labourers, whether they could get vegetables or not. It is a question worth consideration, whether it would not so add to their health and vitality as to enable them much better to resist or throw off malaria and other diseases. It is a question also whether it would not similarly benefit even Europeans when sometimes, as during war, food cannot be properly varied.

I think mine managers would do well to try this and some other experiments, and to have "leting" regularly well prepared and issued in proper quantities to native labourers. The managers could have it well made in the light of scientific developments of the arts of malting and brewing so far as the production of wholesome "sweet wort," crude or clarified, is concerned.

I have known it well made from maize, and clarified and bottled. It then tasted much like bottled effervescent American cider.

"Leting" can, however, be easily and well prepared in the Basuto way. They make it by taking good, sound, unbroken kafir corn (Mabele) and malt-ing it. When malted they call it "mela," from the verb "mela," to *sprout*. To malt the kafir corn it is soaked in clean spring water for two or three days till it gets soft. They then drain it of the water, and put it in a heap on a clean floor, or on mats, covering it well up with skins, sacking or blankets. Sometimes in cold weather they put heated stones between the coverings. But care has to be taken not to let the corn either be heated too much or chilled, as it will rot, turn grey, or mildewed. Europeans sometimes put it in a box or tin or a jar with a lid, cover it up, and in cold weather put it near a stove. When the grain has properly sprouted, —that is, when the sprouts are half an inch long, it is uncovered and spread out to cool. After that, this malted grain is allowed to sweat a few hours, and then it is yet more spread out and turned, in order to dry it completely,

in the sun. After it is quite dried and hard, it is well ground to a fine meal, and is then ready for use in making "leting."

"Leting" is made fresh each day. It is prepared towards evening, so that it may be ready to be drunk sooner or later the next day. The ground malt is thrown into a pot while at the same time boiling water is poured on it. It is kept briskly stirred all the time, *until not a particle of the malt meal remains at the bottom*; it is of the consistency of thin dough, and is generally of a bright red colour, if the kafir corn has been properly malted. The pot is then set aside till the liquid is cold; then cold water is added while it is being stirred, till it is of the consistency of thin gruel. Then a handful of the dregs of former "leting" is put in, or a small cupful of the "leting" of the day before, and this is stirred up with it. It is then covered up till the next day when, earlier or later, it is ready for use, fermentation having sufficiently set in. It should then be sweet, but visibly fermenting and slightly stinging to the tongue from the bubbles of carbonic acid gas. When the right stage of sharpness to the palate is reached, the whole is strained through a sieve or a long narrow bag called "motlotlo." It is then the proper orthodox "leting," and would be called sweet wort in England. This is the "leting" of the old days of Moshesh and his ancestors. It was in the old time considered un-chieflike to drink anything at all intoxicating. Some Basuto women are famed for making "leting" to perfection. It is an art.

Even after the dregs of "leting" are strained out, water is added to them, and when the whole has settled this also is used as a light fermented drink.

"Leting" gets more sour towards evening and still more so the next and next day, until it grows quite too sour for use. For each day of its age it has a separate name. The Basuto like to drink very sour things, even vinegar.

The dregs of "leting" are sometimes used to mix with meal to make bread.

Nowadays the woman in Basuto-land, in making "leting," sometimes leave a little of the malt meal at the bottom of the pot when the water is

poured into it. This is the unorthodox way; it sets up a somewhat different degree and character of fermentation, so that the "leting" when made begins to approach a little in its nature towards "joala," the intoxicating beer, and is not so nice to drink.

The difference between proper and either improper "leting" or "joala" is one of degree and character, of fermentation; a brewer would understand it well.

"Joala," the Basuto's real strong intoxicating beer, is, I believe, made by boiling the sweet wort, and adding and stirring into it a quantity of the meal of raw (not malted) kafir corn, and leaving it to ferment further; then a much stronger vinous fermentation takes place and "joala" is formed and can be made very strong. It has to me an unpleasant crude raw taste and is gritty. It is used purposely to get tipsy or drunk upon. For this purpose it is drunk in very large quantities till the stomach is quite distended. It is said to keep on fermenting in the stomach, and that this hastens the intoxication. This is produced in all stages up to the violent and stupefying stage. It causes violent headaches, bloodshot eyes, indigestion and often several days' illness, even when not mixed with spirits. Natives often add brandy to it, and this of course renders it worse than either beer or brandy in its effects. It is partly this practice no doubt which was represented to Lord Milner, and caused the temporary absolute prohibition of kafir beer in towns and mining centres. I have no doubt of the wisdom of that decision.

Whether such kafir beer is ever really good for food, even in small quantities, is a matter which should be enquired into; perhaps so far as it possesses the same qualities as "leting" it may be of some, but less, use. My impression is that even in small quantities it is very upsetting to digestion, and that pure "leting" would be much better. I do not dogmatise, I only suggest enquiry and experiments.

Probably a craving for something requisite for the nourishment of the body, but missing from the dietary, is at the bottom of the desire for spirituous liquors in many cases among all people. It would seem that there exists a natural demand in the human

system for some acid product of fermentation to meet a general or special requirement of health.

Setting on one side the products of distillation and drinks called alcoholic, such as wine and beer (although these are really the results of fermentation), also bread, to make which fermented yeast is employed, I would mention as indicative of this natural craving the "quass" of the Russians, the sauerkraut of the Germans, the cider of the English labourer, and another acid drink made from the refuse of the apples after the juice has been pressed out of them. Boiling water is poured upon it and allowed to stand for forty-eight hours in order to ferment. Among African natives we find "leting" and kafir beer; "mead," or honey and water fermented; sour milk in different stages of fermentation, called "amasi" by kafirs, "mashi," by Bechuanas, "mafi" by Basutos, "qbei milk" by Hottentots, and "sak melk" or "calbas melk" by Boers. The same thing is called "koumiss" in Russia. All these are fermented drinks, and the fermentation would appear to make them all more assimilable by digestion. But there seems to be some other reason for the universal desire for the products of fermentation than this, some instinct pointing to their purifying effect upon the blood, some specific action. It must be remembered that we give our stock fermented food, sweet or sour ensilage, from Silo pits, which are an invention many thousands of years old. Where distillation from potatoes is carried on, the refuse is greedily eaten by cattle. So also are brewers' grains.

There is another article of food of this character, used by the Basutos, which I should like to mention, as it completes a set of facts upon which I would suggest some provisional conclusion to be arrived at, for further investigation in the future.

The Basutos, owing to the natural increase of population and narrowing of territory, have become crowded into the lower and cultivable parts of Basutoland. They are thus principally and largely cultivators and ploughmen, and have turned much of the pasture lands near their homes into cornfields and gardens. They have to send cattle far away into high moun-

tains in summer ; this has led to milk becoming a scarce article with most of them, so they cannot largely live on fermented sour milk as they formerly did. A remarkable change in their dietary has followed ; they have invented a new sour, fermented article of food—not drink—a sour porridge, which they call “sekhakabolo,” and I have learnt that it is becoming the main food of the people. I learn that the Matabele make some sort of sour porridge, too. They call it “ihambaze.”

The Basuto, to make it, take coarse mealie meal or crushed mealies. They add to this a handful of the “mela” I have described, that is, kafir corn malted and ground for making “leting.” They pour boiling water on this mixed stuff, stirring it well in the way I have described in the first process of making “leting.” After letting it cool, they add cold water and cover it up and leave it till the next day. When it has fermented they strain off the water and put that in a pot on the fire to boil. In the meanwhile they grind up (on their large flat grinding stones, with their round one held in the hand) the coarse wet mealie meal dregs, which have remained after drawing off the water and when this water has boiled they stir the mashed mealies into it ; the result is an acid porridge, which they relish very much, just as the Scotch labourer relishes his sour sowens. That is now the principal food of the people, and on it they work hard and thrive.

They cultivate land extensively, and besides this, nearly three-fourths of the adult males go out every year to labour abroad.

It is remarkable that, together with the working out of this change, they have deliberately banished brandy, and that as a people, and in the mass, they are generally sober. The dietaries adopted by great labouring populations in different countries are broad facts upon which provisional conclusions may well be founded.

It is not well to generalise upon a few data ; but I think I have already brought together sufficient broad facts to show that it is probable, and worth further testing by experiment, that the health, vitality, and power of sustained labour, and of resistance to disease among native

labourers, might be promoted by providing them with some such food and drink as I have described as being used to advantage by Basutos and others. I do not say, provide it by the same mode of preparation ; but I do say : Enquire, experiment, and try providing some food which has undergone such an amount and character of fermentation as will make it assimilate well, and supply what is apparently wanted in the human system. It is often said drinking lemon, or limejuice, and even rubbing it into the skin, gives some protection from malaria ; Perhaps drinking the vegetable acid of “leting” would do as well ; it would be much cheaper.

If native labourers could be given plenty of vegetable food and fruit, and perhaps limejuice, and, in short, varied diet, probably nothing else would be required ; but it might be impossible, because too expensive to do that, so it might be just as well to try what is quite practicable, i.e., simply to malt the grain, which is easily and cheaply obtainable, and then make some fermented food or drink of it, at an expense merely nominal, for grain has in any case to be furnished as the main food of natives.

Where native labourers appear healthy, strong, and happy in their work, it might seem wiser to let well alone, though perhaps some variety would make them even more strong, well, and happy ; but if it happens, as it sometimes does, that a remarkable amount of sickness shows itself, even occasionally, among native labourers, then serious endeavours must be made to discover the cause and the remedy. I suggest one remedy—attention to diet ; there may be various other things to attend to besides diet, and I am sure there are, but I confine myself at present to the one question, diet.

There are different other articles of diet I could mention which might be provided as a change, and different methods for preparing them ; I am only opening up the subject a little.

There is one other way of making a very light, easily digestible, nourishing food from kafir corn, which I had better mention. It is the food which the Basuto always use on long trips. I have used it myself. They

call it "dipabi." To make it, kafir corn is parched in a pot highly heated over a strong fire. The grains generally burst open with a jump and turn themselves more or less inside out. Colonists call this "springing," and they call such grain *sprung* grain, i.e., sprung kafir corn or sprung mealies. In America it is called "popping corn." This the Basutos grind with a very little salt; they carry it in small kid-skins on their backs when travelling, or in leather bags on pack animals. It is simply chewed, with an occasional sip of water.

In December, 1873, having suddenly received orders to that effect, I called out a little army of about 200 native mounted infantry to co-operate with other forces against Langalibalele. We had it in prospect that, before reaching other food supply, we should have a fortnight's march up and down the highest mountains in South Africa, the Maluti of Basutoland, a then uninhabited part of that country. I ordered all the women in the neighbourhood to prepare "dipabi" that night, and I provided a little salt to grind with some of it, and a little sugar with the rest. It was cheap; the whole expedition of six weeks' duration cost the Government £1 per man, with his food, horse, and ammunition. On this "dipabi," and meat killed on the road, and but sparingly used, we marched, generally leading our horses, and walking and running as mounted infantry should, till we got into the inhabited part of the north of Basutoland. The men did excellent marching, and could have done so without the meat. I mention this to show another way of giving variety with the same article of food. I have heard of Basutos marching hundreds of miles on "dipabi" alone, carried on their backs. I have often wished our sometimes stunted soldiers marching near Basutoland could have had it. In any case it gives variety. I am sure there is considerable chemical change in the parched and burst grain, and that analysis would easily show the reason of its nutritiousness.

I shall now deal with one or two objections likely to arise in a mind considering the questions I have raised. I shall try to deal fairly with these

objections. One will say: What about the Kimberley and De Beers compounds, where the dietary question has been already tested on a large scale? I would answer: Examine that experiment fairly. I was at Kimberley in 1894 on the Labour Commission. My recollection is that the labourers were all well developed, well selected, very well treated, well paid, and evidently happy men. They were often paid by results; that is, by truckloads, measurements of work, and number of holes bored. In the compounds there is a hospital with hospital comforts, and the De Beers shop, where they can obtain any article of diet they please to ask for and pay for, with the exception of brandy and kafir beer. I saw in that shop, besides bread, fruit and vegetables, a quantity of bottles of fermented ginger beer, which may be an equivalent of the letting, which I would suggest our introducing.

Since writing the above I have had the advantage of questioning the chairman of the De Beers Consolidated Mines, and have learnt from him that experience during the war has taught them lessons. Their trained native labourers had to leave, and they have now raw recruits from outside. These, owing to the war, came there with scurvy, and readily succumbed to pneumonia in consequence. So some months since the system was introduced of issuing to the native labourers one pint of kafir beer per man per diem. This has had marked beneficial results. I understand Mr. Rhodes wrote from Europe recommending this.

It will be asked: What do you say of the experiment made on an immense scale already throughout Africa in convict diet and labour? I answer: I have not examined those experiments. I question whether any government fully knows the results. They are rather difficult to test; will-power has to be considered as a disturbing factor. One can test fuel power in machines and state the results in foot pounds, but even with a treadmill you cannot test the value of food in work produced, unless some peculiarly constituted person chooses to try and test it on a treadmill on his person for a long time and manages to keep happy and avoid

depression.

One has to deal much with will-power and cheerfulness in these matters, and convicts are not enthusiastic labourers. From observation of convicts once in the Cape Colony, I doubted whether sometimes they were even earning their salt.

I have, however, stated remarkable experiences with regard to convicts and their diet, I have at times heard of similar ones, and I think the experiment I have suggested might well and cheaply be tried with the native—if not other—convicts, throughout Africa. It is only broad results that can be looked for.

I would suggest some other questions and answers—broad ones. I should like to ask officers of health throughout Africa: Are natives who feed themselves in their natural state, or those *fed as labourers by Europeans*, whether in prisons or at mines, better nourished? Is scurvy a prevalent disease in Africa? If so, where, and among what classes is it to be found? What is their food, and how is it prepared? Scurvy is simply a result of defective nourishment. It is produced by diet alone, and cured by diet alone.

I think, if the truth were known, it would be found that throughout South Africa, wherever war is being waged, there, not only a tendency to scurvy exists, but the thing itself, which for obvious reasons, always has accompanied war. It could easily and cheaply be cured, whether among Europeans or natives, by sweet wort or leting, unless, indeed, complications such as dysentery or malaria should set in, as they frequently do. They naturally become very dangerous, when added to any scorbutic tendency. Inflammation of the lungs is, I believe, a common accompaniment of scurvy and is then rapidly fatal.

Scurvy rapidly destroys the red corpuscles of the blood; so does malaria. Thus, when malaria attacks a person in whom the red corpuscles are already greatly diminished by the defects in diet which tend to produce scurvy, malaria finds its fell work well on its way to accomplishment.

The diluted citric, malic, acetic, and lactic acids respectively found in special combinations in lime and lemon

juice, cider, sweet wort, sour milk, buttermilk, &c., would seem to tend to produce healthy blood, the generation of red blood corpuscles, and perhaps their oxygenation, and to prevent their destruction.

Supposing it was decided that sweet wort, "leting," or other fermented food should be supplied to labourers, either as an experiment or as a permanent arrangement, the question with large employers of labour would be how to supply it. Well, European maltsters could be employed, or malting could be studied in books, or with the little explanation I have given, malting could be attempted, or natives could be employed to make it, especially women, who are the maltsters, brewers, and cooks. Some malt better than others. Then as to preparing sweet wort or other food, similar procedure could be adopted. Perhaps a brewer's man could be employed, perhaps natives, to make non-intoxicating sweet wort, perhaps some Scotchman would teach how to make sowens. Or some Basutos could be introduced, men, women, and children, and manufacture food and teach the natives and others by object lessons. They are much in advance of other natives in their cookery and in keeping vessels clean, a most important point in brewing. They are comparatively an industrious people, both men and women, and have for three-quarters of a century worked for Europeans, to mutual advantage both in outdoor and indoor work, and might set the natives here a good example.

Probably it would be found that food could be much better and more economically prepared wholesale for native labourers, when in considerable numbers than when left to them; division of labour is itself economical, native *men* are not cooks, and natives are great wasters of fuel and want to keep a big fire going night and day.

Natives at their homes only eat two meals a day, about 10 a.m. and 7-30 p.m.

Since writing the above and other matter which I shall presently read out, I have, as I from the beginning intended, collected more information from native commissioners regarding varieties of farinaceous grain and

pulse cultivated and used either with or without fermentation by natives here.. I shall now refer to these.

Maize (*zea mays*) is now called "Indian corn," or simply "corn," in its native country (America), and "mealies" in South Africa. This is grown here more by farmers than natives, and bought by employers of native labour in preference to other kinds, as it is easily harvested, cleaned, and ground.

The natives generally grow a small, hard, flinty husked variety. After damping the grain a little they stamp it with a big wooden pestle in a mortar called a "stamp-block" by the Boers, and they winnow it to drive the coarse husk away. They then put it in a pot and pour warm water over it so as to cover it; they let it soak for a day, then they thoroughly wash it, partly dry it, and afterwards stamp it again and winnow it again to get a second skin off it. Then they dry it, and the most approved way is to put it into a pot, which the Mashona call "ruenga," to make it perfectly dry and *warm*, when it grinds better into a fine meal. Sometimes instead of this they first break it in the stamp-block into a coarse meal called "sengwa," which may be cooked and eaten. Otherwise they grind the "sengwa" on a stone.

The Mashona seldom boil the stamped mealies whole, as Boers do. They grind it fine and place the meal in the sun to dry, and keep it for use. Meal from all sorts of grain is called by the Mashona "ufu." They stamp, husk, and grind all grain in the elaborate ways I have described, and they call all porridge made from any grain "sadza" or "tsadza."

In Natal mealies are generally grown from better varieties than the Mashona's mealies, and are often eaten boiled whole, or after one stamping, or the meal is ground without the above preparation and boiled for porridge. The Agricultural Department here has recently introduced a small quantity of a Peruvian variety, and will obtain more. [Cuzco or Peruvian maize, obtainable from Messrs. Praskauer & Co., Ltd., 112, Fenchurch Street, London, E.C.; 28, Brunswick Street, Liverpool, and 50 High Street, Hull. Telegraphic Address: Prask-

kauer, London]. It is very much larger than any yet introduced, and has a very thin, brittle husk. It gives much fine flour. *The flinty husk of the original maize has been bred off this grain.* Such maize promises to become a great source of food supply, as maize is readily cultivated and dealt with by machinery. We could be taught many ways of cooking it by colonists from the United States.

Kafir corn, or great millet, is known in science as *sorghum vulgare*; in Kafir, Amazimba; in Zulu, Amabele; by the Basuto, Mabele; by the Mashona, Mabfunde or Mafunde; in the Soudan, Dhurma.

It is less used in Mashonaland than some smaller grain presently to be mentioned. It may be used, as it is by kafirs and Basuto, both boiled whole or after ridding it of the husk by stamping; the meal is generally used boiled as porridge, or sometimes in a much thicker, tough mass, which may be called bread; or it is made into "leting" or kafir beer. This grain is much grown through a great part of Africa and Asia, and more or less in Europe and America.

Rukweza, or Rapoko, (known in science as *eleusine coracana*) is a very small, *hard*, red grain, looking like kafir corn, but from a wholly different, low-growing plant. It is said the Mashonas have six varieties of it differently named. I learned from Mr. George Watt, a government officer stationed in the Indian Museum, Calcutta, whose special duty it is, as government "reporter," to investigate matters connected with economic products, that this grain and munga (of which presently), are both largely grown and used in India as articles of food, but are supposed to have been introduced from Africa. They are probably the original food grain of Mashona-like tribes of Central Africa, and, like other grain, developed from a grass. I learn also that *eleusine coracana* is now much grown in Japan, so it is extending its range, and suits a wide range of climate. Under European cultivation "rukweza" grows much taller, tillers much better, bears more and deve ops larger grain than when cultivated by natives. Probably like Maize and "pedigree wheat" it might, by repeated selection and care-

ful cultivation, be bred to have a less flinty and a thinner husk, while its size might be progressively increased. At present its diminutive size and hardness give it an advantage in one respect :— it is impenetrable by weevils. It appears to me the most nitrogenous of farinaceous grains. Natives consider food prepared from it more nutritious and satisfying than that from any other grain. Rice-eating natives from other countries quickly learn to prefer food prepared from “rukweza.” It and “munga” can be sown late, after other native grain crops show they will fail from drought, locusts, etc., so they are anti-famine crops. As yet, a disadvantage in these two crops and kafir corn is that winning them is a slow, laborious, difficult process. They do not lend themselves to present methods of machine-threshing or milling. I propose to submit to the Scientific and Technical Department of the Imperial Institute specimens of these three, in the grain and in the ear and straw, for examination and advice as to the possibility of machinery being adapted or devised for threshing, grinding, husking and other treatment. I propose to place before that very strong and well-equipped Department which has been instituted to aid and advise all parts of the Empire, the following questions :—

(A) Have any systematic efforts yet been made to improve these grains, and for the above objects, and, if so, with what results?

(B) Is it probable that by careful and continuous selection for a few years with improved cultivation, the hard husk of kafir corn, rapoko, and “munga” could be reduced to a minimum and the grain enlarged, as has been done with mealies and wheat, and with quicker maturity?

(C) Is it probable that by developments of machinery, these grains could respectively, in an improved manner, be harvested, cleaned, husked, and milled, and this on a commercial scale, and that they could be cooked in a simple way on a large scale?

(D) Would it be well to have them analysed to ascertain their relative value in food constituents?

(E) How would the desired results best be promoted: by departmental

experiments, or by stimulating scientific investigation, cultivation, and invention by offers of rewards by Governments or Departments?

My impression is that Agricultural Departments of England, America, India and Africa and other countries, and the Imperial and Smithsonian Institutes, should cause these enquiries and experiments to be made, for individual efforts can effect little, and only slow, improvement.

When I was administering Basutoland some twenty years ago, I found that for years early rains had been failing and that the staple crop, kafir corn, had not time to grow, so partial famine was produced. I made such enquiries as I could as to quicker maturing varieties of that slow-growing grain, and obtained in consequence, at my own expense, one variety of kafir corn from Abyssinia, and “amber cane” from Missouri; but I left, and could not press on the experiments.

What is wanted is to see whether this quick maturing, etc., cannot be accomplished, and whether rapoko and mungo may not have serious value as, at least, a supplementary crop to save the situation when rains will not fall in time. These grains appear not only to have come to stay, but to be extending in the world's cultivation, and it would seem worth while to improve them.

It may possibly aid the Institute's department in its enquiries if I mention that I was once shewn, and ate, at an isolated American Mission, a very light cake made of rapoko, and advantageously used by a person whose digestion had been impaired by illness. The rapoko was “sprung,” then well ground, and then “bolted” through some fine stuff so as only to leave a fine flour of which the cake was made. I do not mean to suggest that native labourers are to be fed on cakes.

Natives complain, perhaps with some little truth, that all their grain is rendered disagreeable or injurious to them by European methods of grinding. It must be remembered, however, that Basuto and others grind kafir corn without husking it, and even eat it boiled whole. At home, as I have said, the Mashona women always stamp “rukweza,” etc., in stamp blocks to get

rid of the hard husk before they grind it into a fine meal. They mix it with sufficient water, and boil it about half-an-hour, continually stirring it with a stick, to make their porridge. With it they use salt, which they now obtain from Europeans. They used to obtain it by burning a certain grass growing beside rivers, putting the ashes in water, filtering it through sand, and boiling the water till a sediment of salt was produced. Each village used to have its salt manufacturer. (Native labourers will require to be well provided with salt.)

"Munga," or "nyautzi," as the Zulus call it, is *penisetum typhoideum*. It is a small whitish millet-like grain growing on a head or cob something like a large bulrush, at the head of a stalk something like that of kafir corn. Natives particularly dislike the meal made from this grain by grinding it in European mills, they say the porridge from it gives them internal pains and dysentery, from the presence in it of particles of the flinty husk. They only eat it at home after this husk is got rid of by stamping, and it has been finely ground and made into porridge.

Rice has always been grown and used by Mashonas; the husk is got rid of by means of the stamp block.

With regard to Pulse, there are a number of kinds of beans "inyemba," and there is "*Arachis Hypogea*" called monkey nut, pea nut, or ground nut (from growing under ground). The Zulu name is "mazamban," and the Mashona name "zungu" or "inzungu."

I understand there are two varieties of these monkey nuts; they are generally used as follows:—

They are first partly baked on a fire in the Mashona baking pot "ruenga" above mentioned. When they are brown, they are taken off the fire and rubbed between the hands to remove the skins. They are then crushed and ground, when they turn into a thick oily mixture. This is put into a little pot called "hodghgana" or "tshikari," containing boiling water. The who'e is well mixed, and is called "doorve." The native porridge is eaten, first dipping it into this "doorve," which is also mixed with a porridge made with rapoko meal and boiled pumpkin, the whole being then called "noorpe."

"Doorve" is also mixed with boiled wild greens and other vegetables.

If meat is procurable as a substitute, "doorve" is not mixed with other boiled vegetable food, but *tainted* meat is itself eaten with "doorve" and is said by the Mashona to become then most delicious and preferable to fresh meat.

This and much more than I can now publish I have lately from Mr. Native Commissioner R. Nesbitt, V.C., to whom I am greatly indebted.

A considerable variety of vegetables is grown by natives at their homes; these include sweet potatoes, called "mbambayira" or "mbambayila," also pumpkins and kafir water-melons. The last two are cut into strips, dried in the sun, and kept for winter use by the Basuto and Bechuana. Potatoes are as yet only grown by Europeans, and they sell at a very dear rate. Basutos grow melons and water-melons largely and make spinach of several kinds of herbs.

Manioc or cassava (thesweet variety, I believe), from which tapioca is manufactured, and cassava beer is made in other countries, is grown in Portuguese Territory and Melsetter; it is called "zambuya." The Boers in Melsetter call it "brood boom" (bread tree). They dry the roots and stamp them, and thus obtain a fine white flour which they mix with wheat flour to make bread. They use it also to thicken soup. I have grown manioc here, and think it will grow generally in Rhodesia, especially in granite sand, or near granite hills.

As for fruit, generally only wild sorts are eaten by natives.

From the above list of articles of food grown, it would at first sight, perhaps, seem easy to supply a sufficient variety of vegetable food to keep native labourers in health, but the difficulty is to get that food to the labourers, away from their distant homes and gardens. Supply and demand do not balance, and transport is difficult. Eventually, to supply many mines, fully and economically, European ploughing, farming and machinery and steam will be required, so the native diet question will become eminently a "farmers' question." Great industries will require great economies of human labour. It is not hands,

hoes, and fingers, or little native gardens that will supply the food of the future. Natives will be more economically employed at mines. Machinery must replace uneconomical hand work.

As to meat, the Mashonas eat almost everything that lives. They roast or cook, and greedily eat the most stinking meat, and probably are often ill from doing so, and put it down to witchcraft, and then want somebody to be killed. Meat is too dear to supply to native labourers generally.

For the above reasons—the difficulty of furnishing variety of food in meat, vegetables, and fruit—I have been endeavouring to show how, even when the supply of food is almost or altogether restricted to grain, it may be so prepared as to sufficiently nourish the body and maintain health. I have shown that malting and brewing is one of the ways of so preparing food.

I have now to communicate information I have asked for and obtained through officers of the Native Department as to how these arts are practised among the aboriginal inhabitants of Rhodesia.

Mashonas, in order to malt grain, generally soak it in a bag or basket in cold water for one, two, or more days. Some afterwards place it in a bag or basket to sprout or malt, while others put it in an open heap in the sun for that purpose instead of covering it as the Basutos do. Then they dry and grind the malt but in a few parts beer is made from unground malt.

No. 1 process then is this: Some boil the ground malt till it forms a thin gruel, while some only heat it over the fire without allowing it to boil. It is, in either case, constantly kept well stirred, and is then left to cool and ferment in a clean pot. Some place it for this purpose in a pot or pots *with a neck*. Such a pot with a neck is called a “fukoor” (this sounds Arabic). When sweet and fermenting, and for some days, it is used at meals by the whole family; *children are constantly fed upon it*. It is then like the Basuto “leting” in its early stage, and Europeans sometimes imagine it has honey in it. It is drunk from one day to five or six after making, and is

called in different tribes, “bumi” or “bumhe” or “buru” or “doro” (this is Arabic), and sometimes “begwa maïro” (i.e., “cooked in the evening”).

No. 2 process: To make beer of some strength this “bumi,” on the day following that on which it was made, is put back into a pot and boiled strongly for two or three hours till it is reduced to one-half its quantity. This is then, in some parts, put into necked pots, and when quite cool, a flat stone is put upon it, and it is luted or sealed with clay. This beer will, when so covered, last a month, but it is not very strong.

No. 3 process: To make a stronger beer, the kind last described is allowed to stand three full days. Then three or four pounds of ground malt, uncooked, is added to each pot and it is sealed up and left standing for two full days. It is now called “m’sungwa,” and is stronger.

No. 4 process: To make a yet stronger beer, double the amount of ground malt is prepared, as for the first process (bumi), and strained and added to the last mentioned (m’sungwa).

If one part of No. 4 is added to an equal part of No. 3, the beer is very strong, and one pint and a half is enough to make an ordinary man intoxicated.

Where it is not required to be so strong, two parts of No. 3 (m’sungwa) is added to one part of No. 4.

After mixing, the whole is left to stand for 12 hours before drinking. For a time the longer it stands the stronger it becomes, but after three days it becomes too sour to drink.

It is principally men who drink intoxicating beer; they frequently become mad-drunk.

I pass over the modes of making beer practised by kafirs, Matabele, and Zulus. There are local differences, and none appear to come up to the perfection of that of the Mashona brewers, whose procedure I have described above: this procedure I suppose is like that of the Spaniards of the time of Pliny, who, he says, were in advance of the Gauls.

Natives say that “rukweza” produces stronger beer than any other grain.

Natives in Portuguese territory be-

yond our north-east border, and some within it, distil spirit from must, made from a small wild plum. They use a gun-barrel as a nozzle to the still—so, I think, did Sir Samuel Baker, when he made potato spirit in Uganda. The knowledge of distilling is likely to spread, and spirit will then be distilled by natives from grain and other things and mixed with beer.

It will be seen from above how necessary it is to distinguish when talking of “kafir beer,” and that anything from a sweet or sour gruel to a highly-intoxicating beverage may be included under the name “beer”; all *look* much alike.

Beer is made from the mahoboba fruit and from the berries of the artsha or marhaasha tree, also from the squeezed out sap of two trees (olives) mugwiranga and mazira. This reminds one of spruce, birch and maple beer, which are the most ancient British fermented beverages.

It has lately been suggested in the Chamber of Mines that natives, when coming up heated from the mines into the perhaps cold night air, should be given a cup of hot coffee before going to their compounds. I venture to suggest, firstly, that a hot drink might make them only perspire the more, and become more susceptible to chill; so that if any hot drink ought to be given, it should be after they reach a warm shelter. Then I would suggest that if a hot drink is required, it should be something like hot gruel, rather than coffee, which would tend to prevent their sleeping; and, finally, I am inclined to think that at night a good warm blanket or a loose, warm, woollen shirt, or both, put on then, would better protect from cold than a hot drink would. I do not wish to be led to go much beyond my subject, “diet,” but I must venture to suggest that it will be better for the health

and capacity for work of native labourers that they should occasionally don a good dry blanket, rather than either constantly wear European clothing (which they *will* wear day and night, and wet and dry, and always dirty and soaked with bodily exhalations), or wearing nothing at all but their usual strip of loin calico, which, to avoid buying a blanket, some will restrict themselves to both day and night, and in rain and dew, while they *will* strive only to roast themselves at night at a fire, one side at a time, if they can. Generally speaking, the naked native is more hardy against cold than the clothed one, because the skin of his body is hardened, as the skin of our faces and hands is. Wearing merely a blanket on occasion, to defend from cold the more vital parts in the trunk of the body, does not diminish this hardiness.

To get good work from natives they must be rationally taken good care of, and taught, with great difficulty, to take good care of themselves. They suspect white people's advice, and require native advisers.

This difficulty I may illustrate:—A native took service with me. He was already ill, and it turned out that he had double pneumonia. I took him to the hospital, he complained of being starved, that they were not *feeding him up!* Also that they washed him in the middle of the night (he was being fomented with hot water) and it would kill him! Presently he ran away while in the crisis, to try to get a witch doctor, luckily he was caught and his life saved, against all probability.

I have now, as I set out to do, slightly raised the fringe of a great subject, to let in a little light and induce investigation and discussion. If in dealing with native diet I have furnished some food for useful thought, I shall be much pleased.

